1st Research Meeting on Biochemistry

9th and 10th December 2021
Maringá, Paraná, Brazil

Post-Graduation Program in Biochemistry

State University of Maringá

1st Research Meeting on Biochemistry

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Oral abstracts presentations

Thursday – December 9th

Elaine Kaspchak 04:20 pm

Effect of saponin on asparagine-glucose Maillard reaction

Maria Gabriela Leichtweis 04:35 pm

Haskap and blackthorn berries anthocyanin profile

Adriana Katherine Molina Vargas 04:50 pm

Study of Prunus spinosa l. fruit epicarp and Lonicera careulea l. fruit: alternative natural colorants with bioactive properties

Alexis Pereira 05:05 pm

Novel antioxidant and fibre- rich food ingredients from quince peel

Beatriz Helena Paschoalinotto 05:20 pm

Effect of fertilization via nutrient solution on the nutritional profile and chemical composition of Chicorium spinosum l.

Nairana Mithieli de Q. E. Melo 05:35 pm

Effects of arsenial compounds on fructose metabolism on the perfused rat liver

Friday – December 10th

Mateus José de Oliveira 04:20 pm

Effects of a high-fat low carbohydrate diet on plasmatic parameters, in vivo glucose metabolism and fatty liver development in rats: a study under different energetic conditions

Ana Cláudia Castro Novais 04:35 pm

Nutritional and chemical analysis and bioactive potential of aromatic and medicinal plants traditionally used as condiments

Ana Paula Ames Sibin 04:50 pm

Characterization and bioactivity of Copaiba essential oil carried in a self-emulsifying system

Mikel Añibarro-Ortega 05:05 pm

Solanaceae crop by- products as renewable sources of bioactive phenolic extracts

Paulo Vinicius M. C. Menezes 05:20 pm

Isocitrate lyase as a molecular target for weed suppression

Gustavo Henrique de Souza 05:35 pm

Effects of a Myrciaria jaboticaba Peel Extract and role of cyanidin-3-O- Glucoside on lipase in mice

EFFECT OF SAPONIN ON ASPARAGINE-GLUCOSE MAILLARD REACTION

Elaine Kaspchak,[1*] Aline Theodoro Toci,[2] Luciana Igarashi Mafra,[1] Marcos R. Mafra[1]

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Saponins are molecules commonly found in foods of plant origin (*e.g.* yerba mate and quinoa) or can be added to foods as foaming and emulsifying agents. These molecules are composed by a triterpenoid or non-polar steroid aglycone attached to hydrophilic oligosaccharides [1,2] and are capable of interact with proteins [3]. Therefore, its effect on reactions involving proteins and aminoacids is demanded. In this context, the aim of this work was to study the effect of saponin on asparagine-glucose Maillard reaction at pH 7 and 150 °C. The effect of different saponin concentration and time of reaction on the formation of melanoidins and acrylamide was studied by UV-VIS [4] and HPLC [5], respectively. Results obtained by this work (Figure 1) showed that the melanoidins and acrylamide content of asparagine-glucose model system increase linearly in function of saponin concentration. The effect of saponin is more evident after 20 min of reaction. Thus, the addition of saponin and plant extracts rich is these substances may be evaluated when products submitted to heating are developed mainly due to the acrylamide formation that can be carcinogenic.

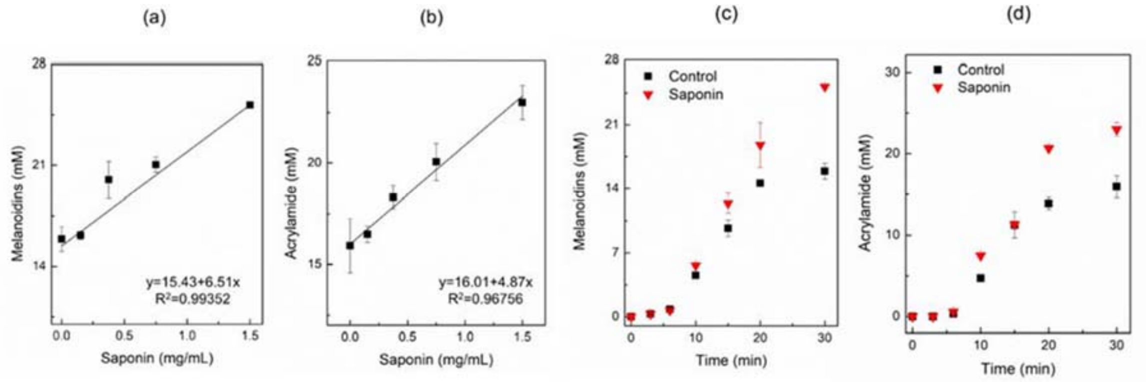

Figure 1: Effect of saponin on the formation of melanoidins (a, c) and acrylamide (b, d) by Maillard reaction (150 °C; pH 7) in function of saponin concentration (a, b) and time of reaction (c,d). The effect of reaction time (c, d) was performed with a saponin concentration of 1.5 mg/mL. The concentration of asparagine and glucose was 0.1 mol/L for all experiments.

References

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HASKAP AND BLACKTHORN BERRIES ANTHOCYANIN PROFILE.

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Anthocyanin compounds are pigments that have a red, blue, and/or violet coloration widely found in nature, mainly in fruits [1]. Given the current need to replace synthetic colorants with healthier natural alternatives, this study investigated the potential of haskap (*Prunus spinosa* L.) and blackthorn (*Lonicera careulea* L.) fruits as sources of anthocyanins. For this purpose, the characterization of these fruits (the hydroethanolic extract of blachthorn epicarp and the haskap juice) was carried out by high performance liquid chromatography coupled to a diode array detector and a mass spectrometer (HPLC-DAD/ESI-MS). The identification was carried out using standards, when available, comparing their retention times, UV-Vis spectra, and mass spectra. In the absence of standards, the identification was carried out by the fragmentation profile and by comparison with the information available in the literature. The quantification was performed from the peak areas recorded at a wavelength of 520 nm, compared to the standard calibration curves.

The blackthorn epicarp showed two anthocyanin compounds, being the molecules present in the highest concentrations cyanidin-3-*O*-rutinoside ($[H]^+$ at *m/z* 595) and peonidin-3-*O*-rutinoside ($[H]^+$ at *m/z* 609). In haskap berries, six anthocyanins were identified, namely cyanidin-*O*-hexoside-*O*-hexoside ($[H]^+$ at *m/z* 611), cyanidin-*O*-rhamnoside-*O*-hexoside ($[H]^+$ at *m/z* 595), pelargonidin-3-*O*-glucoside ($[H]^+$ at *m/z* 433), peonidin-3-*O*-glucoside ($[H]^+$ at *m/z* 463), peonidin-*O*-rhamnoside-*O*-hexoside ($[H]^+$ at *m/z* 609), and cyanidin-3-*O*-glucoside ($[H]^+$ at *m/z* 449), with the latest as the most abundant one. These results demonstrate that the blackthorn fruit epicarp and haskap fruits can be considered great sources of pigments in the red-purple colour range, having applicability both in the food and pharmaceutical industries.

References

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Acknowledgments

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